

# PATENT SPECIFICATION

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DRAWINGS ATTACHED



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## (54) SEALING MEANS

(71) We, B.A.L. LIMITED, of Polypac Works, Dudley, Worcestershire, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to sealing means for providing a seal between two opposed surfaces, and the surfaces being defined upon a pair of members which are movable relative to each other so that the surfaces may not remain in fixed relationship to each other.

The object of this invention is to provide such a sealing means in a simple and convenient form.

Sealing means in accordance with the invention comprises in combination, an annular body portion, a pair of spaced annular tongues extending in one direction from the body portion, said tongue defining sealing surfaces for co-operation respectively with the surfaces on said members, and a pair of integral ear portions disposed at the free ends of said tongues, said ear portions extending inwardly towards each other, the tongues and ear portions being formed from resilient material, the arrangement being such that in use, with the sealing means disposed between the surfaces of said members, the ear portions are urged into contact with each other thereby ensuring that the material from which the tongues and the ear portions is made is in a compressed state so that the sealing surfaces are urged into firm contact with the surfaces respectively of said members.

One example of a sealing means in accordance with the invention will now be described as applied to the provision of a face seal for a joint between a pair of pipes which are angularly movable relative to each other. The joint includes a pair of members connected to the pipes and which define respectively a pair of spaced substantially parallel surfaces. The surfaces have openings formed therein which form part of

the flow passages defined by the pipes. In use, when the members move angularly the faces are not maintained parallel to each other this being as a result of physical loading of the joint and the problem is to establish a seal between the surfaces.

The sealing means is shown in its free state in the accompanying drawing and it comprises a body portion 10 which is annular in form. Its outer peripheral surface is provided with spaced circumferential grooves 11 which are provided to compensate for slight differences in the overall diameter of the sealing means when it is moulded in different materials in the same mould. Extending inwardly from and formed integrally with the body portion 10 towards the axis of the sealing means are a pair of spaced tongues 12 and in the free state the tongues also extend axially beyond the body portion. Moreover, at their free ends the tongues 12 are provided with integral ear portions 13 respectively these being inclined inwardly toward each other and the axis of the sealing means.

The tongues and ear portions define an annular cavity 14 which in the free state has a continuous opening defined between opposed faces 15 of the ear portions. In use, however, and as will be described the faces 15 are held in contact with each other so that the opening is closed but to permit fluid under pressure to enter the cavity 14, the faces 15 are provided with opposed grooves 16.

The junctions between the axially outer faces of the tongues and the ear portions define sealing edges 17 although when the sealing means is in position these edges will be flattened to provide sealing surfaces. Moreover disposed outwardly of the edges 17 are a plurality of spaced circumferential grooves 18. The parts of the sealing means are moulded integrally from a resilient material which is chosen for its ability to withstand attack from the fluid conveyed in the pipes.

When the sealing means is assembled

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the members are moved towards each other so that the edges 17 contact the aforesaid surfaces of the members and until the inner portions of the surfaces 15 of the ear portions are in engagement with each other. Continued movement of the members towards each other causes the material forming the tongues 12 and the ears 13 to be compressed and this ensures that the edges 17 are urged into sealing engagement with the surfaces of the members. In this manner when the surfaces of the members move out of parallel with each other during angular movement of the members, the sealing edges can follow the surfaces to maintain the seal. The grooves 18 are positioned so that their boundary surfaces will also be in contact with the surfaces of the members and they act to reduce the area of the sealing means in contact with said surfaces thereby minimising the effort required to move the members relative to other.

It will be understood that the sealing means described may be used to provide a seal between a pair of spaced cylindrical surfaces. In this case the tongues extend in an axial direction but the ear portions extend towards each other as in the example described.

Moreover, the sealing means would be accommodated within an annular groove defined in one of said cylindrical surfaces conveniently the outer surface and the groove would be provided with a detachable end wall to facilitate assembly. Furthermore, in either of the examples the body portion may be reinforced with a suitable insert or a portion of it may be formed from a different material.

#### WHAT WE CLAIM IS: —

1. Sealing means for the purpose specified and comprising in combination, an annular body portion, a pair of spaced annular

tongues extending in one direction from the body portion, said tongues defining sealing surfaces for co-operation respectively with the surfaces on said members, and a pair of integral annular ear portions disposed at the free ends of said tongues, said ear portions extending inwardly towards each other, the tongues and ear portions being formed from resilient material, the arrangement being such that in use, with the sealing means disposed between the surfaces of said members, the ear portions are urged into contact with each other thereby ensuring that the material from which the tongues and the ear portions is made is in a compressed state so that the sealing surfaces are urged into firm contact with the surfaces, respectively of said members.

2. Sealing means as claimed in claim 1 in which the tongues and ear portions when the sealing means is in use, define an annular cavity, grooves being defined in the ear portion whereby the cavity is in communication with the space bounded by the innermost surfaces of the ear portions.

3. Sealing means as claimed in claim 1 or claim 2 in which the sealing surfaces are provided with a plurality of grooves respectively thereby to reduce the area of the sealing surface in contact with the surfaces of the members.

4. Sealing means as claimed in any one of the preceding claims in which the body portion, the tongues and the ear portions are formed integrally from a resilient material.

5. Sealing means for providing a seal between two opposed and substantially parallel surfaces, and comprising the combination and arrangement of parts substantially as hereinbefore described with reference to and as shown in the accompanying drawing.

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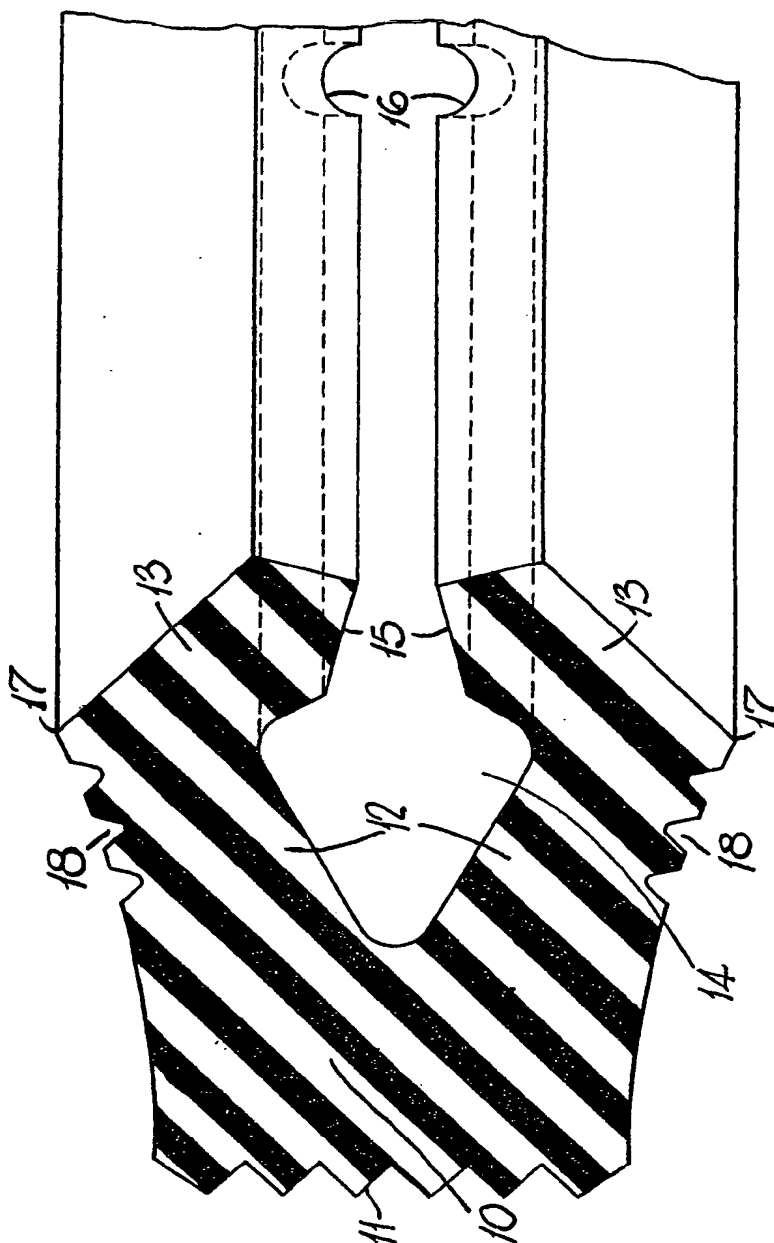
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COMPLETE SPECIFICATION

1 SHEET

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